



**DEPARTMENT OF THE AIR FORCE**  
**AIR FORCE FORCE PROTECTION BATTLELAB**  
**1820 ORVILLE WRIGHT PLAZA, SUITE 3**  
**LACKLAND AIR FORCE BASE TEXAS 78236-5558**

15 December 2000

MEMORANDUM FOR   FPB/FPC (Maj Koch)  
                          FPB/CD (Lt Col Swaby)  
                          FPB/CC (Col Springs)

FROM: FPB/FPM (MSgt Davis)

SUBJECT: Trip Report -- TORESS Foal Eagle 00

1. PURPOSE. Conduct the Tele-Operated Remote Engagement and Surveillance System (TORESS) Foal Eagle operational test.

2. TRAVELERS. MSgt Glynn E. Davis, Mr Ed Coleman, Mr Ray Page (Sandia)

3. ITINERARY:

- Depart for Kunsan AB, Korea, 15 Oct 00
- Conduct Test, 17 - 27 Oct 00
- Return to San Antonio, TX, 28 Oct 00

4. KEY PERSONNEL CONTACTED.

Col Buchholtz	HQ PACAF/SF
Lt Col Gathright	HQ PACAF/SFX
Lt Col Beck	HQ AETC
Lt Col Welch	HQ AETC
Lt Col Perry	8 SFS/CC
Maj Vance	HQ PACAF/SFXT
Maj Hazlett	17 AF
Capt Lambert	8 SFS/SFO
Capt Salyers	8 SFS/SFT
CMSgt Monaccio	XOF/CCM

5. EXECUTIVE SUMMARY. The Foal Eagle 00 operational test was the first security forces application test for the TORESS initiative. The operational environment afforded us many opportunities not realized during the control environment test. This environment aided in the identification of several problems with the system.

First and foremost, the night vision technology used during the Foal Eagle test is no where near the capability needed to "own the night." The weather also allowed us to identify additional problems. We discovered the system is not as waterproof as first believed. On two occasions, the rain caused a short in the system. Also, the wind caused a few minor problems with the target camera and scope alignment, which identified a requirement to strengthen and refine the target camera adjustment assembly.

While we had a few problems, we also had a few successes. All of the daytime engagements were successful. The sector observed and defended by the system was impervious to breaches. The system will greatly enhance the capability of security forces. This was proven through the TORESS system's ability to observe and engage targets that defensive positions could not.

## 6. DISCUSSION:

a. System Employment. The system was placed on top of the 130' water tower in Wolfpack Park (see Figure 1). Its primary sector of fire was a 70-degree arch overlooking a rice field which ends at the base perimeter fence. The system's right limit was the perimeter fence running up to the base of the tower from the main gate (see Figure 2). The left limit covered an unimproved road leading up to the perimeter fence. The tower position afforded a great plunging fire opportunity. Secondary and supplemental positions were sited but never used.



Figure 1



Figure 2

The defense force operations cell assigned the TORESS to one of the sectors (D sector) that was the most likely to be probed or penetrated during the exercise. The D sector commander didn't waste any time in fully integrating the TORESS into the overall sector defense plan. Furthermore, D sector commander assigned 3 SF personnel to employ the TORESS on a 24-hour basis. The 8 SFS personnel were a welcome addition to the CE staff assigned to defend the base water treatment facility, where the TORESS was positioned. Also, the SF personnel assisted CE personnel in developing and employing an integrated water treatment facility defense plan.

The exercise controllers allowed us to simulate a Barrett .50-cal as the system's primary weapon versus the 5.56 mm weapon mounted to the system. Because of this, several assumptions had to be made, but none affected our ability to evaluate the system. For instance, the Barrett only has a 10 round magazine capacity, so after 10 rounds the system was placed on hold until ample time was allotted for a magazine exchange. Our goal was to keep the exercise test as realistic as possible.

For reasons beyond our control, Multiple Integrated Laser Engagement System (MILES) gear was not used during Foal Eagle 00. As a result, system enemy engagements had to be visually assessed by an exercise controller. The assessments were made either on site during an engagement or after an engagement by a controller viewing our video recording from the gun camera (see Figure 3). No controller engagement assessment disputes were encountered.



Figure 3

b. System Performance. The system performed as expected during day time operations. This was proven through approximately three daytime engagements which the system got credit for seven enemy kills. During night operations we experienced several problems.

The initial night vision technology incorporated into the system was not adequate. Target identification and tracking was a guess at best. We were limited to engaging and tracking moving shadows as targets. We engaged several targets by integrating the use of the water tower's Wide Screen Thermal Imager (WSTI). We tapped into the signal and viewed the feed with a monitor placed next to the TORESS monitor. This allowed for positive identification of enemy targets.

During intermediate rain showers, the system short-circuited. The problem was corrected by waterproofing the cable at the exposed connections. The wind moved the targeting camera out of alignment with the scope of the weapon, which required up to 20 minutes to realign the targeting camera. We also to go through this process when switching from the day scope to the night vision scope just before dawn and dusk each day. When you look at the concept of operations for TORESS, this is not the optimal way to employ the system.

c. Overall Observations. In its current configuration, because of the limitations of the night vision technology and target camera alignment, the system is not adequate to perform in a security force defensive role. Current night vision scope type targeting (AN-PVS 4) is not sufficient to positively identify targets or determine friend from foe. System down time needed to switch from a day to a night scope requires the system to be taken out of operation and most importantly exposes the operator to enemy observation and fire, which defeats the purpose of the initiative.

7. RECOMMENDATION: Research and test thermal imaging technology. Replace the current targeting camera with a thermal scope to allow for engagement of targets during day and night operations. This should eliminate the need for switching from a day scope to a night scope and resolve the scope alignment problems. The thermal technology does exist and would allow for positive identification of a target and assessment of target intent; however this technology is expensive.

Sandia National Laboratories is currently researching thermal technology. They are planning to integrate the technology into the current system as a system upgrade. This has already been funded by the Battlelab. Once Sandia has completed the system integration, we will plan and conduct another operational test to evaluate the SF application feasibility.

8. If you have any questions, please contact MSgt Davis, at DSN: 473-0058 x 208.

GLYNN E. DAVIS, MSgt, USAF  
TORESS, Project Manager

cc:  
HQ PACAF/SF  
7 AF/SF  
8 SFS